WHAT IS CLAIMED IS:

1. In a vertical conduction power MOSFET comprising a die of monocrystaline silicon having an upper and lower surface and having a first conductivity type; a relatively thin layer of epitaxially grown silicon of said first conductivity type atop said top surface; a plurality of spaced channel regions of a second conductivity type diffused into the top surface of said epitaxially grown silicon layer; a respective source region of smaller area than said channel regions of said first conductivity type diffused into each of said channel regions and defining lateral invertible channels in the space between the peripheries of said channels and their respective sources; a MOSgate structure overlying each of said invertible channels; a source electrode overlying the top of said die and connected to each of said channel and source regions, and insulated from said MOSgate structure; and a drain electrode coupled to said epitaxially grown silicon layer; the improvement which comprises said channel diffusions having a depth less than 3 microns, and said source diffusion having a depth less than 0.3 microns.

2. The MOSFET of claim 1, wherein said first and second conductivity types are N and P respectively.

3. The MOSFET of claim 1, wherein said invertible channels have a length of less than about 1 microns, whereby the distance between respective pairs of said source and channel regions at their corner points of maximum curvature is about 2.5 microns.

4. The MOSFET of claim 1, which further includes a rectangular trench extending through the center of each of said source regions and into its respective

channel region; and a high concentration contact diffusion of said first conductivity type disposed in the bottom of said trench; said source contact filling said trench and contacting said high concentration diffusion.

5. The MOSFET of claim 2, which further includes a rectangular trench extending through the center of each of said source regions and into its respective channel region; and a high concentration contact diffusion of said first conductivity type disposed in the bottom of said trench; said source contact filling said trench and contacting said high concentration diffusion.

6. The MOSFET of claim 3, which further includes a rectangular trench extending through the center of each of said source regions and into its respective channel region; and a high concentration contact diffusion of said first conductivity type disposed in the bottom of said trench; said source contact filling said trench and contacting said high concentration diffusion.

7. The MOSFET of claim 5, wherein said first concentration type is N and wherein said high concentration contact diffusion is a phosphorus diffusion formed with an effective implant energy of greater than about 350 keV for a singly charged phosphorous ion.